What is claimed is:

1. An AM compatible digital audio broadcasting signal, the signal comprising:

an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal; and

a plurality of digitally modulated subcarrier signals in the radio channel, wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation (CPTCM) including a code mapped to overlapping partitions.

2. The AM compatible digital audio broadcasting signal of claim 1, wherein the code comprises:

a complementary punctured convolutional code.

3. The AM compatible digital audio broadcasting signal of claim 1, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals.

4. The AM compatible digital audio broadcasting signal of claim 1, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel and a first group of the plurality of digitally modulated subcarrier signals are delayed with respect to a second group of the plurality of digitally modulated subcarrier signals.

5. A transmitter for broadcasting an AM compatible digital audio broadcasting signal, the transmitter comprising:

means for producing an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal;

means for producing a plurality of digitally modulated subcarrier signals in the radio channel, wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation including a code mapped to overlapping partitions; and

means for broadcasting the analog modulated signal and the plurality of digitally modulated subcarrier signals.

6. The transmitter of claim 5, wherein the code comprises:

a complementary punctured convolutional code.

7. The transmitter of claim 5, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals.

8. The transmitter of claim 5, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel and a first group of the plurality of digitally modulated subcarrier signals are delayed with respect to a second group of the plurality of digitally modulated subcarrier signals.

9. A receiver for receiving an AM compatible digital audio broadcasting signal, the receiver comprising:

an antenna for receiving a composite signal comprising an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal, and a plurality of digitally modulated subcarrier signals in the radio channel, wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation including a code mapped to overlapping partitions; and

means for producing an output in response to the composite signal.

10. The receiver of claim 9, wherein the code comprises:

a complementary punctured convolutional code.

11. The receiver of claim 9, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals.

12. The receiver of claim 9, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel and a first group of the plurality of digitally modulated subcarrier signals are delayed with respect to a second group of the plurality of digitally modulated subcarrier signals.

13. The receiver of claim 9, wherein:

the composite signal and the data service signal are processed on interleaver block boundaries.

14. An AM compatible digital audio broadcasting signal, the signal comprising:

an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal;

a first plurality of subcarrier signals in a first portion of the radio channel and a second plurality of subcarrier signals in a second portion of the radio channel, wherein the first and second pluralities of subcarrier signals are complementary modulated subcarrier signals and have a power spectral density below the analog modulated carrier by a first margin;

a third plurality of subcarrier signals in a third portion of the radio channel and a fourth plurality of subcarrier signals in a fourth portion of the radio channel, wherein the third and fourth pluralities of subcarrier signals are complementary modulated subcarrier signals and have a power spectral density below the analog modulated carrier by a second margin; and

a fifth plurality of subcarrier signals in a fifth portion of the radio channel and a sixth plurality of subcarrier signals in a sixth portion of the radio channel, wherein the fifth and sixth pluralities of subcarrier signals have a power spectral density below the analog modulated carrier by a third margin;

wherein the first, second, third, fourth, fifth and sixth pluralities of subcarrier signals are modulated by one or more digital signals, the first margin is larger than the second margin, and the second margin is larger than the third margin.

15. The signal of claim 14, wherein:

the digital signals are complementary pattern mapped signals.

16. The signal of claim 14, wherein:

the first and second pluralities of subcarrier signals are QPSK modulated; and

the third, fourth, fifth and sixth pluralities of subcarrier signals are 16-QAM modulated.

17. The signal of claim 14, wherein:

the first portion of the radio channel encompasses frequencies between about 0 kHz and about + 6 kHz from the analog modulated carrier;

the second portion of the radio channel encompasses frequencies between about 0 kHz and about - 6 kHz from the analog modulated carrier;

the third portion of the radio channel encompasses frequencies between about + 6 kHz and about + 7 kHz from the analog modulated carrier;

the fourth portion of the radio channel encompasses frequencies between about - 6 kHz and about - 7 kHz from the analog modulated carrier;

the fifth portion of the radio channel encompasses frequencies between about + 7 kHz and about + 10 kHz from the analog modulated carrier; and

the sixth portion of the radio channel encompasses frequencies between about - 7 kHz and about - 10 kHz from the analog modulated carrier.

18. The signal of claim 14, further comprising:

a seventh plurality of subcarrier signals in a seventh portion of the radio channel and an eighth plurality of subcarrier signals in an eighth portion of the radio channel, wherein the seventh and eighth pluralities of subcarrier signals have a power spectral density at least 40 dBc below the analog modulated carrier; and

wherein the seventh and eighth pluralities of subcarrier signals are modulated by the one or more digital signals.

19. The signal of claim 18, wherein:

the digital signals are 25 kbps signals coded at a rate of 4/5.

20. The signal of claim 18, wherein:

the seventh portion of the radio channel encompasses frequencies between about + 10 kHz and about + 15 kHz from the analog modulated carrier; and

the eighth portion of the radio channel encompasses frequencies between about - 10 kHz and about - 15 kHz from the analog modulated carrier.

21. A method of broadcasting an AM compatible digital audio broadcasting signal, the method comprising the steps of:

producing an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal;

producing a plurality of digitally modulated subcarrier signals in the radio channel, wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation (CPTCM) including a code mapped to overlapping partitions; and

transmitting the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals.

22. The method of claim 21, wherein the code comprises:

a complementary punctured convolutional code.

23. The method of claim 21, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals.

24. The method of claim 21, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel and a first group of the plurality of digitally modulated subcarrier signals are delayed with respect to a second group of the plurality of digitally modulated subcarrier signals.

25. The method of claim 21, wherein the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel, the method further comprising the step of:

eliminating or suppressing the subcarriers in an upper partition of subcarriers, or the subcarriers in a lower partition of subcarriers, or the subcarriers in both the upper partition of subcarriers and the lower partition of subcarriers depending upon interference conditions.

26. A transmitter for broadcasting an AM compatible digital audio broadcasting signal, the transmitter comprising:

an analog modulator for producing an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal;

a digital modulator for producing a plurality of digitally modulated subcarrier signals in the radio channel, wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation including a code mapped to overlapping partitions; and

an antenna for broadcasting the analog modulated signal and the plurality of digitally modulated subcarrier signals.

27. The transmitter of claim 26, wherein the code comprises:

a complementary punctured convolutional code.

28. The transmitter of claim 26, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals.

29. The transmitter of claim 26, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel and a first group of the plurality of digitally modulated subcarrier signals are delayed with respect to a second group of the plurality of digitally modulated subcarrier signals.

30. A receiver for receiving an AM compatible digital audio broadcasting signal, the receiver comprising:

an antenna for receiving a composite signal comprising an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal, and a plurality of digitally modulated subcarrier signals in the radio channel, wherein the digitally modulated subcarrier signals are modulated using complementary pattern-mapped trellis code modulation including a code mapped to overlapping partitions; and

an output device for producing an output in response to the composite signal.

31. The receiver of claim 30, wherein the code comprises:

a complementary punctured convolutional code.

32. The receiver of claim 30, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 20 kHz channel and the analog modulated signal is delayed with respect to the plurality of digitally modulated subcarrier signals.

33. The receiver of claim 30, wherein:

the analog modulated carrier signal and the plurality of digitally modulated subcarrier signals are in a 30 kHz channel and a first group of the plurality of digitally modulated subcarrier signals are delayed with respect to a second group of the plurality of digitally modulated subcarrier signals.

34. The receiver of claim 30, wherein:

the composite signal and the data service signal are processed on interleaver block boundaries.

35. A method of broadcasting an AM compatible digital audio broadcasting signal, the method comprising the steps of:

producing an analog modulated carrier signal centrally positioned in a radio channel, wherein the analog modulated carrier signal is modulated by an analog signal;

producing a first plurality of subcarrier signals in a first portion of the radio channel and a second plurality of subcarrier signals in a second portion of the radio channel, wherein the first and second pluralities of subcarrier signals are complementary modulated subcarrier signals and have a power spectral density below the analog modulated carrier by a first margin;

producing a third plurality of subcarrier signals in a third portion of the radio channel and a fourth plurality of subcarrier signals in a fourth portion of the radio channel, wherein the third and fourth pluralities of subcarrier signals are complementary modulated subcarrier signals and have a power spectral density below the analog modulated carrier by a second margin;

producing a fifth plurality of subcarrier signals in a fifth portion of the radio channel and a sixth plurality of subcarrier signals in a sixth portion of the radio channel, wherein the fifth and sixth pluralities of subcarrier signals have a power spectral density below the analog modulated carrier by a third margin;

wherein the first, second, third, fourth, fifth and sixth pluralities of subcarrier signals are modulated by one or more digital signals, the first margin is larger than the second margin, and the second margin is larger than the third margin; and

transmitting the first, second, third, fourth, fifth and sixth pluralities of subcarrier signals.

36. The method of claim 35, wherein:

the digital signals are complementary pattern mapped signals.

37. The method of claim 35, wherein:

the first and second pluralities of subcarrier signals are QPSK modulated; and

the third, fourth, fifth and sixth pluralities of subcarrier signals are 16-QAM modulated.

38. The method of claim 35, wherein:

the first portion of the radio channel encompasses frequencies between about 0 kHz and about + 6 kHz from the analog modulated carrier;

the second portion of the radio channel encompasses frequencies between about 0 kHz and about - 6 kHz from the analog modulated carrier;

the third portion of the radio channel encompasses frequencies between about + 6 kHz and about + 7 kHz from the analog modulated carrier;

the fourth portion of the radio channel encompasses frequencies between about - 6 kHz and about - 7 kHz from the analog modulated carrier;

the fifth portion of the radio channel encompasses frequencies between about + 7 kHz and about + 10 kHz from the analog modulated carrier; and

the sixth portion of the radio channel encompasses frequencies between about - 7 kHz and about - 10 kHz from the analog modulated carrier.

39. The method of claim 35, further comprising the steps of:

producing a seventh plurality of subcarrier signals in a seventh portion of the radio channel and an eighth plurality of subcarrier signals in an eighth portion of the radio channel, wherein the seventh and eighth pluralities of subcarrier signals have a power spectral density at least 40 dBc below the analog modulated carrier;

wherein the seventh and eighth pluralities of subcarrier signals are modulated by the one or more digital signals; and

transmitting the seventh and eighth pluralities of subcarrier signals.

40. The method of claim 39, wherein:

the digital signals are 25 kbps signals coded at a rate of 4/5.

41. The method of claim 39, wherein:

the seventh portion of the radio channel encompasses frequencies between about + 10 kHz and about + 15 kHz from the analog modulated carrier; and

the eighth portion of the radio channel encompasses frequencies between about - 10 kHz and about - 15 kHz from the analog modulated carrier.

42. The method of claim 39, further comprising the step of:

eliminating or suppressing the seventh plurality of subcarriers, or the eighth plurality of subcarriers, or the seventh plurality of subcarriers and the eighth plurality of subcarriers depending upon interference conditions.